

Replanning the Performance Measurement Baseline

Presented At The
NASA Project Management Conference
March 2004

Dorothy J. Tiffany
National Aeronautics and Space Administration
Goddard Space Flight Center

Definitions

❖ Performance Measurement Baseline

- ◆ *The time-phased budget plan against which all work performance is measured*

❖ Over Target Baseline

- ◆ *A new performance measurement baseline resulting from failure to meet the original objectives*
- ◆ *Exceeds the original target costs and requires customer approval*

❖ Over Target Schedule

- ◆ *A revised schedule baseline with new activities and milestones extending beyond the contractual completion*

Definitions

❖ Reprogramming

- ◆ *A comprehensive replanning of remaining contractual effort that results in a total budget and/or total schedule greater than the contractual requirements*
- ◆ *Process that results in an OTB or OTS*

❖ Replan

- ◆ *A change in the original plan for accomplishing authorized contractual requirements that stays within the existing constraints of the contract*

A few reasons for updating the plan...

- ❖ Estimate at completion (EAC) is less than actual costs for some elements
- ❖ Existence of zero budget work packages
- ❖ Cost and schedule variance explanations are no longer meaningful
- ❖ Inability to effectively use the performance data
- ❖ Unrealistic activity durations and relationship logic
- ❖ Depletion or rapid use of management reserve
- ❖ Lack of confidence in contractor's EAC

Contributors to reprogramming

~A few experiences ~

- ❖ Launch dates were changing and remaining schedule was no longer achievable
- ❖ Original spacecraft integration & test schedule durations were unrealistic
- ❖ Earned Value information was unreliable:
 - ◆ *Cost and schedule variances were not meaningful*
 - ◆ *Contractor was unable to forecast performance because of flawed data*
 - ◆ *Difficulty determining causes of performance problems due to lack of understanding of basis of estimate*
- ❖ Depletion of all management reserve

More experiences...

- ❖ Disruption from major contractor relocation greatly increased contractor risk and changed significant assumptions relating to basis of estimate
 - ◆ *Loss of technical experience base*
 - ◆ *Almost 100% turnover in first level managers*
 - ◆ *Change from non-union to union shop*
 - ◆ *New systems (engineering, quality, accounting)*
 - ◆ *New senior management chain*
 - ◆ *New manufacturing & test facilities and procedures*

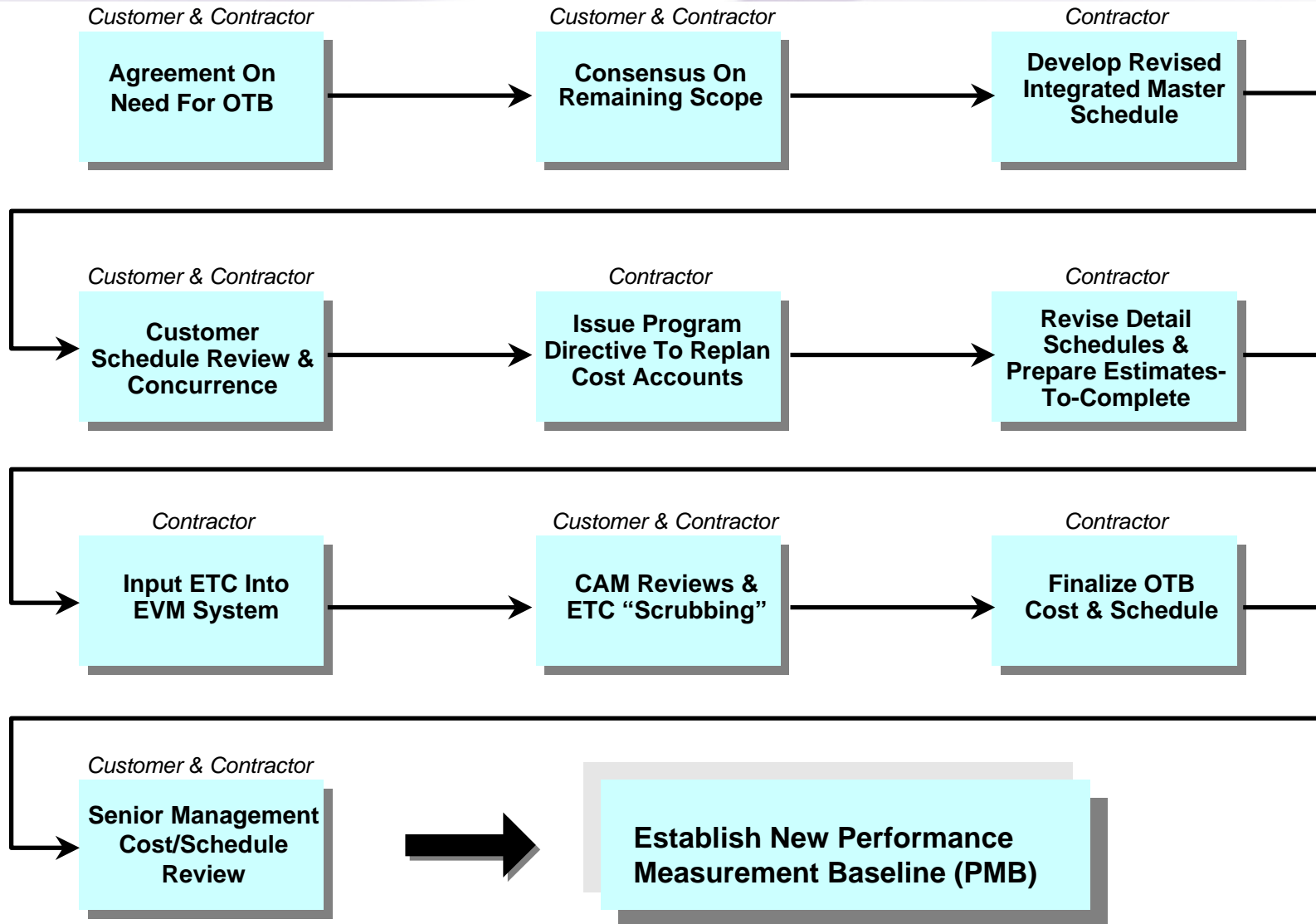
And more experiences...

- ❖ Major technical problems
 - ◆ *Design errors*
 - ◆ *Human errors on factory floor*
 - ◆ *Material shortages*
- ❖ Escalating cost overruns (40%)
- ❖ Significant contract change order traffic
 - ◆ *Contractor often slow preparing proposals and revising plans*
 - ◆ *Failure to identify “end-of-contract” or program extension impact of changes on cost and schedule*
 - ◆ *Customer directed task orders*

A few thoughts before committing to a replan

- ❖ A contract should be greater than 20% and less than 85% complete before considering a replan
- ❖ Projected cost growth should be greater than 15% for the remaining work
- ❖ At least a year of work should be remaining
- ❖ Conduct a benefit analysis to make sure the cost of implementing a replan is not greater than the benefits
- ❖ Some historic cost and schedule data could be lost from an OTB/OTS implementation

The OTB Process Flow



1. Agreement On Need For An OTB/OTS

(Customer & Contractor)

Process Steps

- ❖ Contractor evaluates remaining budgets and schedule to determine need for a formal reprogramming
- ❖ Contractor notifies customer
- ❖ Customer & contractor assess realism of current baseline and discuss ground rules for proceeding with the replan
- ❖ Customer notifies contractor to proceed with OTB through contracting officer

Lessons Learned

- ❖ Customer and contractor need to establish “partnership” in OTB process up front
- ❖ Customer needs to independently develop a cost & schedule estimate of the OTB in order to assess realism of contractor EAC

2. Consensus On Remaining Scope (Customer & Contractor)

Process Steps

- ❖ Customer & contractor identify problems that caused the need for a new baseline
- ❖ Customer & contractor identify and document scope to be included in OTB (e.g. list proposals, task orders)
- ❖ Customer & contractor verify and agree on new scope to be included in the OTB

Lessons Learned

- ❖ Contractor must adhere to SOW
- ❖ Customer must avoid giving, and the contractor must avoid accepting, verbal direction
- ❖ Contractor must maintain detailed proposal status log
- ❖ Contractor must carefully account for scope in/out of schedule & undistributed budget (UB)
- ❖ Customer keep careful records regarding future scope items not included in OTB (future changes/revisions)

3. Develop Revised Integrated Master Schedule (Contractor)

Process Steps

- ❖ Contractor verifies schedule activities, durations & logic
- ❖ All planning should be based on a valid and realistic schedule
- ❖ Contractor confirms facility and resource availability will support schedule
- ❖ Contractor documents programmatic and schedule assumptions and constraints

Lessons Learned

- ❖ Contractor must ensure its contract documentation is up-to-date
- ❖ Contractor should utilize logic network
- ❖ Contractor should utilize project scheduling professionals
- ❖ Contractor must incorporate realistic constraints, reserve, etc. into schedule
- ❖ A good schedule promotes communication & coordination among contractor team
- ❖ Contractor should maintain only one set of schedule “books”

4. Customer Schedule Review & Concurrence

(Customer & Contractor)

Process Steps

- ❖ Assess logical sequencing of work in schedule
- ❖ Validate activities, durations & logic based on historical actuals and current approach
- ❖ Verify horizontal & vertical schedule integration & traceability
- ❖ Identify differences from prior schedule forecasts
- ❖ Check for conflicts
- ❖ Gauge adequacy of reserve

Lessons Learned

- ❖ Review schedules from a “partner” perspective
- ❖ Independent assessment provides good schedule sanity check
- ❖ Customer and contractor can resolve schedule issues before, not after, ETC pricing
- ❖ Facilitates schedule agreement between customer and contractor

5. Issue Program Directive To Replan Cost Accounts (Contractor)

Process Steps

- ❖ Contractor documents OTB master schedule and ETC preparation guidelines
- ❖ Contractor provides guideline on contract scope to include in OTB (e.g. list of outstanding proposals)
- ❖ Contractor lists assumptions (e.g. schedules, accounting calendar, etc.)
- ❖ Contractor issues directive to start the OTB effort

Lessons Learned

- ❖ Contractor must maintain an OTB schedule/calendar to establish & track deadlines
- ❖ OTB guidelines & assumptions must be clearly understood by the Cost Account Managers (CAMs)
- ❖ An experienced contractor business manager facilitates the OTB process
- ❖ All CAMs and project managers must be actively involved in process

6. Revise Detail Schedules & Prepare ETCs (Contractor)

Process Steps

- ❖ CAMs modify detail schedules
- ❖ CAMs prepare “bottoms-up” staffing, material, travel, etc. ETCs phased against schedules
- ❖ CAMs review ETCs & schedules with functional, program & business managers
- ❖ Finance reconciles remaining UB

Lessons Learned

- ❖ CAMs should not start detail scheduling & ETCs until master schedule is “firm”
- ❖ Contractor must clearly document content of UB
- ❖ Contractor should not “force” changes approved after replan process has begun into the new plan ~ handle as future changes to baseline

7. Input ETC Into EVM System (Contractor)

Process Details

- ❖ CAMs submit ETCs to program finance on time
- ❖ Contractor finance inputs data into EVMS
- ❖ Contractor finance coordinates review and error correction with CAMs

Lessons Learned

- ❖ CAMs must meet ETC submittal deadline
- ❖ Contractor must allow sufficient time to price OTB for accuracy
- ❖ Experienced contractor EVM personnel are vital
- ❖ Contractor must thoroughly review OTB internally before providing final program level cost to Customer

8. CAM Reviews & ETC “Scrubbing” (Customer & Contractor)

Process Details

- ❖ Customer reviews schedules and ETC with CAMs
- ❖ Customer provides feedback to contractor business manager on findings
- ❖ Customer and contractor hold strategy discussions (staffing, schedule, issues, workarounds, management reserve levels, etc.)
- ❖ If done at appropriate level, these meetings eliminate the need for an Integrated Baseline Review at a later date

Lessons Learned

- ❖ Customer involvement demonstrates importance of OTB ~ CAMs take process seriously
- ❖ Customer independent assessment often surfaces overlooked items, issues
- ❖ Customer must have technical team involvement (not just finance & scheduling)

9. Finalize OTB Cost & Schedule (Contractor)

Process Details

- ❖ Contractor modifies budget & schedule per CAM reviews
- ❖ Contractor conducts final project-level review with Customer
- ❖ Contractor issues Work Authorizations & budgets to CAMs

Lessons Learned

- ❖ Contractor must allow time to resolve errors and discrepancies
- ❖ Customer & contractor concurrence needed on results of OTB effort
- ❖ Integrity of historical actuals is easily lost in contract re-locations and accounting system changes
- ❖ Contractor needs a formal system to track Work Authorizations to discourage verbal direction

10. Senior Management Cost/Schedule Review (Customer & Contractor)

Process Details

- ❖ Contractor presents final results of OTB (overruns, schedule impacts) to customer senior management
- ❖ Contractor affirms commitment to complete effort within cost & schedule plan
- ❖ Replan results in identifying contract schedule & value for OTB
- ❖ Customer adjusts incentive plans as necessary

Lessons Learned

- ❖ Goal/threat of a major management review good motivator for contractor (and Customer)
- ❖ Contractor senior management involvement ensures adherence to replan deadlines

Summary of Key Lessons Learned

- ❖ Consensus on realistic master schedule needed up front
- ❖ Customer and contractor must work together on the OTB
- ❖ Contractor business staff and CAMs need EVM experience
- ❖ Changes and revisions must be carefully controlled
- ❖ Contractor's senior management participation in replanning process promotes objectivity and urgency
- ❖ Direct Customer "dialogue" with CAMs instills importance of proper planning and control
- ❖ Customer must independently validate the realism of the replan (ETC & schedule) ~ integration of cost & schedule is paramount

A reprogramming isn't the total solution!

❖ A new baseline will not:

- ◆ *Prevent future cost growth*
- ◆ *Contain cost or schedule overruns*
- ◆ *Improve management commitment*
- ◆ *Force the earned value management system to work properly*

Managing the new baseline

- ❖ Several months after the replan, the statistical EAC formulas may be used again
- ❖ Pay particular attention to the areas that caused the replan to ensure that the new plan is reliable
- ❖ Analyze the use of the management reserve to determine if the new estimates are realistic or if new risks have occurred
- ❖ Monitor the contractor's discipline in maintaining the earned value system, as well as the tracking the data

Conclusion

- ❖ A customer/contractor collaboration in the reprogramming process results in a realistic cost & schedule plan against which:
 - ◆ *performance can be measured*
 - ◆ *forecasts can be made*
 - ◆ *changes can be assessed and incorporated*
 - ◆ *milestones can be achieved*